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DATE MAILED: 01/26/96

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined ☑ Responsive to communication filed on 12/01/1995 ☑ This action is made final.

A shortened statutory period for response to this action is set to expire three (3) month(s), no days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☐ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☑ Claims 1, 4-8, 10-17, 19-22 and 31-34 are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☐ Claims [The PTO no longer identifies cancelled claims] have been cancelled.

3. ☐ Claims _____ are allowed.

4. ☑ Claims 1, 4-8, 10-17, 19-22 and 31-34 are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____ ; filed on _____.

13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

Part III DETAILED ACTION

Specification

1. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as the specification, as originally filed, does not provide support for the invention as is now claimed.

The specification, as originally filed, does not provide support for the recitation in the independent claims that the uniformly redundant array has a "high throughput". Page 11, lines 21-25, of the specification discuss a "relatively high transparency" and a "high signal-to-noise ratio" but it is not clear on what basis this provides guidance to those skilled in the art that the uniformly redundant array has a "high throughput".

Claim(s)—Rejection(s)/35 U.S.C. § 112

2. Claims 1, 4-8, 10-17, 19-22 and 31-34 are rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification. The specification, as originally filed, does not provide support for the recitation in the independent claims that the uniformly redundant array has a "high throughput". This is a *new matter* rejection.

Claim(s)—Rejection(s)/35 U.S.C. §103

3. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

5. Claims 1, 4-7, 14-17, 19, 20 and 21 are rejected under 35 U.S.C. § 103 as being unpatentable over Yin (US 4,521,688) and Westrom *et al.* (US 5,286,973) and Fenimore *et al.* (US 4,209,780).

With respect to independent claim 1, Yin discloses a gamma ray imaging system **20**. The object ABC emits non-focusable gamma rays. The system **20** of Yin comprises a coded mask **22**, a position sensitive detector **24**, an array of charge coupled devices **36** (see column 5, line 63), a signal processor **40** and a display **52**. The uniform distribution of pinholes in a predetermined pattern described by Yin for the screen **22** at column 5, lines

6-8, may be considered to constitute a uniformly redundant array. Nevertheless, those of ordinary skill in the art recognize that the use of a coded mask identified as a uniformly redundant array is known in the art of gamma ray imaging systems as shown by Fenimore *et al.* In view of the effective performance in imaging non-focusable gamma ray emitting objects, it would have been obvious to one of ordinary skill in the art to provide a coded mask identified as a uniformly redundant array in the gamma ray imaging system of Yin.In the art of imaging radiation emitting sources, it is known to provide a visual representation of an area in the field of view of the imaging system and superimpose a representative image of the radiation emitting source on the visual representation. See Westrom *et al.* at column 7, lines 33-42. In view of the improved ability of an operator of the imaging system to associate the location of the radiation emitting source with the visual aspects of the field of view, it would have been obvious to one of ordinary skill in the art to provide such a superimposition in the display **52** of the gamma ray imaging system of Yin.

With respect to dependent claim 4, the gamma ray imaging system of Yin further comprises means for transferring **34** the coded optical signal to the array **36**.

With respect to dependent claim 5, the gamma ray imaging system of Yin further comprises an array of optical fiber tapers (column 5, lines 50-56).

With respect to dependent claim 6, the gamma ray imaging system of Yin further comprises relay optics (column 5, lines 50-56).

With respect to dependent claim 7, the gamma ray imaging system of Yin further comprises an image intensifier **26**.

With respect to dependent claim 14, the gamma ray imaging system of Yin further comprises a scintillator material (column 5, line 17). The use of a crystal as the scintillator material would have been obvious to one of ordinary skill in the art as this is a typical choice for detecting gamma rays.

With respect to dependent claims 15 and 16, the screen **22** of the gamma ray imaging system of Yin is spaced from the position sensitive detector **24**. The choices of cross-sectional area and field of view are within the ordinary skill in the art in view of the intended application and the like.

With respect to independent claim 17, Yin suggests a method of generating a representative image of non-focusable gamma ray emitting source which would comprise the steps of providing a gamma ray imaging device **20** including a coded mask **22**, a position sensitive detector **24**, an array of charge coupled devices **36** (see column 5, line 63), and a signal processor **40**, situating the device so that a gamma ray emitting source ABC is within a field of view of the device, and displaying the image signal. In the art of imaging radiation emitting sources, it is known to create a visual representation of an area in the field of view of the device and superimpose a representative image of the radiation emitting source on the visual representation. See Westrom *et al.* at column 7, lines 33-42. In view of the improved ability of an operator of the device to associate the location of the radiation emitting source with the visual aspects of the field of view, it would have been obvious to one of ordinary skill in the art to superimpose in the display **52** of the gamma ray representative imaging method suggested by Yin.

With respect to independent claim 19, Yin discloses a x ray imaging system **20**. The object ABC emits non-focusable x rays. The system **20** of Yin comprises a coded mask **22**, a position sensitive detector **24**, an array of charge coupled devices **36** (see column 5, line 63), a signal processor **40** and a display **52**. In the art of imaging radiation emitting sources, it is known to provide a visual representation of an area in the field of view of the imaging system and superimpose a representative image of the radiation emitting source on the visual representation. See Westrom *et al.* at column 7, lines 33-42. In view of the improved ability of an operator of the imaging system to associate the location of the radiation emitting source with the visual aspects of the field of view, it would have been obvious to one of ordinary skill in the art to provide such a superimposition in the display **52** of the x ray imaging system of Yin.

With respect to dependent claim 20, the x ray imaging system of Yin further comprises means for transferring **34** the coded optical signal to the array **36**.

With respect to dependent claim 21, the x ray imaging system of Yin further comprises an array of optical fiber tapers (column 5, lines 50-56).

6. Claim 8 is rejected under 35 U.S.C. § 103 as being unpatentable over Yin (US 4,521,688), Westrom *et al.* (US 5,286,973) and Fenimore *et al.* (US 4,209,780) as applied to claim 7 above, and further in view of Yin (US 4,791,300).

With respect to dependent claim 8, the image intensifier **26** of the gamma ray imaging system of Yin ('688) is disclosed broadly. The use of an image intensifier comprising a multistage image intensifier tube is well known in the art of gamma ray imaging systems, as shown by Yin ('300). In view of the improved sensitivity, it would

have been obvious to one of ordinary skill in the art to have the gamma ray imaging system of Yin ('688) comprise a multistage image intensifier tube as shown by Yin ('300).

7. Claims 10, 11, 22, 31 and 32 are rejected under 35 U.S.C. § 103 as being unpatentable over Yin (US 4,521,688), Westrom *et al.* (US 5,286,973) and Fenimore *et al.* (US 4,209,780) as applied to claims 1 and 19 above, and further in view of Miller (US 5,235,191).

With respect to dependent claim 10, the position sensitive detector **24** of the gamma ray imaging system of Yin may comprise a scintillator material or phosphor. The use of a glass scintillator material is known, as described by Miller. In view of the effective performance in generating an optical signal in response to radiation impinging thereon, it would have been obvious to one of ordinary skill in the art to use a glass scintillator for the material of position sensitive detector **24** of the gamma ray imaging system of Yin.

With respect to dependent claim 11, Miller further discloses the use of a plurality of glass fibers. In view of the improved resolution afforded by the use of the fiber structure, it would have been obvious to one of ordinary skill in the art to include a plurality of glass fibers as the position sensitive detector **24** of the gamma ray imaging system of Yin.

With respect to dependent claim 22, the position sensitive detector **24** of the x ray imaging system of Yin may comprise a scintillator material or phosphor. The use of a glass scintillator material is known, as described by Miller. In view of the effective performance in generating an optical signal in response to radiation impinging thereon, it would have been obvious to one of ordinary skill in the art to use a glass scintillator for the material of position sensitive detector **24** of the x ray imaging system of Yin.

With respect to dependent claim 31, the thermoelectric cooling of an array of charge coupled devices in a radiation imaging system is known as shown by Miller. In view of the improved operation, it would have been obvious to one of ordinary skill in the art to include a thermoelectric cooler for the array **36** in the gamma ray imaging system of Yin.

With respect to dependent claim 32, the thermoelectric cooling of an array of charge coupled devices in a radiation imaging system is known as shown by Miller. In view of the improved operation, it would have been obvious to one of ordinary skill in the art to include a thermoelectric cooler for the array **36** in the x ray imaging system of Yin.

8. Claim 12 is rejected under 35 U.S.C. § 103 as being unpatentable over Yin (US 4,521,688), Westrom *et al.* (US 5,286,973), Fenimore *et al.* (US 4,209,780) and Miller (US 5,235,191) as applied to claim 11 above, and further in view of Walker (US 5,308,986).

With respect to dependent claim 12, the use of an external mural absorber coating in the construction of a fiber scintillator is known, as shown by Walker, column 7, lines 17-35. In view of the improved resolution, it would have been obvious to one of ordinary skill in the art to provide that the plurality of glass fibers suggested by Miller include an external mural absorber coating in the gamma ray imaging system of Yin.

9. Claim 13 is rejected under 35 U.S.C. § 103 as being unpatentable over Yin (US 4,521,688), Westrom *et al.* (US 5,286,973) and Fenimore *et al.* (US 4,209,780) as applied to claim 1 above, and further in view of Walker (US 5,308,986).

With respect to dependent claim 13, the position sensitive detector **24** of the gamma ray imaging system of Yin may comprise a scintillator material or phosphor. The use of a plastic fiber scintillator material is known, as described by Walker. In view of the effective

performance in generating an optical signal in response to radiation impinging thereon, it would have been obvious to one of ordinary skill in the art to use a plastic fiber scintillator for the material of position sensitive detector **24** of the gamma ray imaging system of Yin.

10. Claim 33 is rejected under 35 U.S.C. § 103 as being unpatentable over Yin (US 4,521,688), Westrom *et al.* (US 5,286,973), Fenimore *et al.* (US 4,209,780), Miller (US 5,235,191) and Yin (US 4,791,300). The claimed features are found in the references as analyzed below. It would have been obvious to one of ordinary skill in the art to modify the references to include the recited features in view of the improved performance.

A gamma ray imaging system for providing an image of a gamma ray emitting source, which comprises:	Yin discloses a gamma ray imaging system **20** providing an image of a gamma ray emitting source ABC.
a coded mask including a uniformly redundant array, the coded mask receiving non-focusable gamma rays emitted by at least one source, the coded mask generating a coded shadow in response to the gamma rays received thereby;	Yin discloses a coded mask **22** receiving non-focusable gamma rays. Fenimore *et al.* discloses a coded mask identified as a uniformly redundant array.
a glass fiber scintillator situated with respect to the coded mask to allow the coded shadow generated by the mask to impinge thereon, the scintillator generating a coded optical signal in response to the coded shadow impinging thereon;	Yin discloses a position sensitive detector **24** which may comprise a scintillator material or phosphor. Miller describes the use of a glass scintillator material and the use of a plurality of glass fibers.
an optical fiber taper having a first end coupled to the scintillator, the optical fiber taper transferring the coded optical signal to an image intensifier;	Yin discloses an array of optical fiber tapers (column 5, lines 50-56).
a multistage image intensifier tube, having an input coupled to a second end of the optical fiber taper, the image	Yin discloses an image intensifier **26**. Yin ('300) discloses the use of an

intensifier amplifying and intensifying the coded optical signal received from the optical fiber taper to provide increased sensitivity to the system;	image intensifier comprising a multistage image intensifier tube.
an array of charge coupled devices, the array being coupled to an output of the multistage image intensifier tube and generating a coded electrical signal in response to the coded optical signal received therefrom, the array being thermoelectrically cooled to improve a signal-to-noise ratio;	Yin discloses an array of charge coupled devices **36** (see column 5, line 63). Miller discloses the thermoelectric cooling of an array of charge coupled devices.
a digital signal processor, the digital signal processor receiving the coded electrical signal from the array of charge coupled devices and decoding the coded electrical signal to generate an image signal therefrom, the image signal being representative of an image of the non-focusable gamma ray emitting source; and	Yin discloses a digital signal processor **40**.
a monitor, the monitor being responsive to the image signal for displaying a representative image of the source.	Yin discloses a display **52**.

11. Claim 34 is rejected under 35 U.S.C. § 103 as being unpatentable over Yin (US 4,521,688), Fenimore *et al.* (US 4,209,780), Miller (US 5,235,191) and Westrom *et al.* (US 5,286,973).

With respect to independent claim 34, Yin suggests a method for scanning facilities having a plurality of potential radiation sources. The disclosed instrument **20** is a hand-held and portable radiation imaging device. The device **20** includes a coded mask **22**, a position sensitive detector **24**, and an array of charge coupled devices **36** (see column 5, line 63).

The uniform distribution of pinholes in a predetermined pattern described by Yin for the screen **22** at column 5, lines 6-8, may be considered to constitute a uniformly redundant array. Nevertheless, those of ordinary skill in the art recognize that the use of a coded mask identified as a uniformly redundant array is known in the art of gamma ray imaging systems as shown by Fenimore *et al.* In view of the effective performance in imaging non-focusable gamma ray emitting objects, it would have been obvious to one of ordinary skill in the art to provide a coded mask identified as a uniformly redundant array in the radiation imaging device **20** of Yin. The position sensitive detector **24** of the radiation imaging device of Yin may comprise a scintillator material or phosphor. The use of a glass scintillator material is known, as described by Miller. In view of the effective performance in generating an optical signal in response to radiation impinging thereon, it would have been obvious to one of ordinary skill in the art to use a glass scintillator for the material of position sensitive detector **24** of the radiation imaging device of Yin. Miller further discloses the use of a plurality of glass fibers. In view of the improved resolution afforded by the use of the fiber structure, it would have been obvious to one of ordinary skill in the art to include a plurality of glass fibers as the position sensitive detector **24** of the radiation imaging device of Yin. Yin further suggests the steps of transmitting the coded electrical signal **38** to a remote location (digital processor **40**) processing the coded electrical signal to generate an image signal and displaying the image signal. In the art of imaging radiation emitting sources, it is known to create a visual representation of an area in the field of view of the device and superimpose a representative image of the radiation emitting source on the visual representation. See Westrom *et al.* at column 7, lines 33-42. In view of the

improved ability of an operator of the device to associate the location of the radiation emitting source with the visual aspects of the field of view, it would have been obvious to one of ordinary skill in the art to superimpose in the display **52** of the gamma ray representative imaging method suggested by Yin. The transmission of electrical signals in a method of radiation imaging to a remote location is also shown by Westrom *et al.*

Response to Submission(s)

12. The amendment filed December 1, 1995, has been entered.

13. Applicant's arguments filed December 1, 1995, have been fully considered but they are not deemed to be persuasive. With respect to the rejection under 35 U.S.C. § 103, Applicant's arguments regarding the deficiencies of each reference are an attack on the references individually and are unpersuasive where, as here, the references are applied in combination. The test for obviousness is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *Leinoff v. Louis Milona & Sons, Inc.* 220 USPQ 845 (CAFC 1984); *In re Keller* 208 USPQ 871 (CCPA 1981). Furthermore, it is not the law that the motivation to modify the references must be found within the references themselves:

> While there must be some teaching, reason, suggestion, or motivation to combine existing elements to produce the claimed device, it is not necessary that the cited references or prior art specifically suggest making the combination. *In re Nilssen*, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988). Such suggestion or motivation to combine prior art teachings can derive solely from the existence of a teaching, which one of ordinary skill in the art would be presumed to know, and the use of that teaching to solve the same of [*sic*] similar problem which it addresses. *In re Wood*, 599 F.2d 1032, 1037, 202 USPQ 171, 174 (CCPA 1979). In sum, it is off the mark for litigants to argue, as many do, that an invention cannot be held to have been

> obvious unless a suggestion to combine prior art teachings is found *in* a specific reference.

Nies, concurring opinion in *In re Oetiker*, 24 USPQ2d 1443, 1447 (Fed. Cir. 1992). The contention of applicant, that it would not be obvious to replace the Anger camera of Fenimore *et al.* with its bulky photomultipliers and delicate circuitry with a compact, solid-state scintillation observation system as suggested by Yin *et al.*, suggests less than ordinary skill in the art. Applicant should keep in mind the following court decisions when evaluating and considering the proposed combination set forth in an obviousness-type rejection under 35 U.S.C. § 103:

> The test for obviousness is not whether the features of one reference may be bodily incorporated into the other to produce the claimed subject matter but simply what the combination of references makes obvious to one of ordinary skill in the pertinent art. *See, In re Bozek,* 163 USPQ 545 (CCPA 1969). *Also, see In re Mapelsden,* 51 CCPA 1123, 329 F.2d 321, 141 USPQ 30 (CCPA 1964), *and In re Henley,* 44 CCPA 701, 239 F.2d 3, 112 USPQ 56 (CCPA 1956). Further, the question in a rejection for obviousness on a combination of references is what the secondary reference would teach one skilled in the art and not whether its structure could be bodily substituted in the basic reference structure. *See, In re Richman,* 165 USPQ 509 (CCPA 1970). Thus, we would note that it is well settled that the test of obviousness is not whether the features of one reference can be bodily incorporated into the structure of another and proper inquiry should not be limited to the specific structure shown by the references, but should be into the concepts fairly contained therein, and the overriding question to be determined is whether those concepts would suggest to one skilled in the art the modifications called for by the claims. *See, In re Van Beckum,* 169 USPQ 47 (CCPA 1971). Therefore, the issue lies in what the combination of references makes obvious to the person of ordinary skill and not whether a feature of one reference can be bodily incorporated in the other to produced the subject matter claimed. *See, In re Henley, op. cit.*

In response to Applicant's argument that the Examiner has combined an excessive number of references, the number of references does not have a bearing on the propriety of the

rejection, theoretically such could be infinite. *Ex parte Fine*, 1927 C.D. 84 (1926). For at least the reasons explained above, Applicant is not entitled to a favorable determination of patentability in view of the arguments submitted December 1, 1995.

Conclusion

14. Applicant's amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL.** See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

15. Papers related to Group Art Unit 2506 applications **only** may be submitted to Group Art Unit 2506 by facsimile transmission. Any transmission not to be considered an official response must be clearly marked "DRAFT". The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 34-35 (November 15, 1988). The Fax number for Group Art Unit 2506 is (703) 308-7723.

16. *Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Hannaher whose telephone number is (703) 308-4850.*

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2500 receptionist whose telephone number is (703) 308-0956.

ch-1/25/1996

CONSTANTINE HANNAHER
PRIMARY EXAMINER
GROUP ART UNIT 2506